

CLAIMS

1. An electric dust collector comprising:

an holding unit having an oblong shape provided in an air channel of an air conditioner;

5 a high-voltage applying device provided at an end of the holding unit;

a contact protector opening to front and having a cave shape facing substantially downward, the contact protector accommodating a high-voltage power feeding terminal connected to the high-voltage applying device;

10 a filter unit attached to the holding unit; and

a slide projection provided at the filter unit, the slide protection including a high-voltage power receiving terminal removably fitted into the contact protector so that the filter unit is removably mounted on the holding unit.

2. The electric dust collector of claim 1, further comprising

a guide rib provided on one of the holding unit and the high-voltage applying device so as to be parallel to a direction in which the filter unit is pulled out,

20 wherein a groove for accepting the guide rib is provided in the filter unit, the groove reaching substantially a center of the filter unit.

3. The electric dust collector of claim 2, further comprising a latching unit provided at an end of the filter unit opposite to an end at which the high-voltage power receiving terminal is provided, the filter unit being temporarily retained when the filter unit is pulled out.

4. The electric dust collector of claim 1, further comprising a handle provided on the filter unit while biased to the high-voltage power receiving terminal.

5. An electric dust collector arranged to be mounted in an air channel

and to be connected to a high-voltage power supply, said electric dust collector comprising:

a switching unit for turning on and off the high-voltage power supply;

5 a holding unit having a shape to be placed in the air channel, the holding unit holding the switching unit;

a dust collecting unit removably provided on the holding unit and having both sides substantially symmetric to each other;

a ground connecting terminal provided on the holding unit;

10 a ground terminal provided on one of the both sides of the dust collecting unit and electrically connected with the ground connecting terminal; and

a high-voltage power receiving terminal provided on the one of the both sides of the dust collecting unit, the high-voltage power receiving terminal being arranged to be electrically connected with the high-voltage power supply.

6. The electric dust collector of claim 5, further comprising:

20 a switch operation rib provided on the dust collecting unit to activate the switching unit;

a first drop-guard supporter for holding the dust collecting unit, the first drop-guard supporter being provided on a surface of the holding unit, the surface of the dust-collecting unit having the dust collection unit mounted thereon; and

25 a second drop-guard supporter provided on the surface of the holding unit on which the dust-collecting unit is mounted, the second drop-guard supporter being closer to the switching unit than the first drop-guard supporter,

30 wherein the second drop-guard supporter has a holding power is smaller than a holding power of the first drop-guard supporter.

7. The electric dust collector of claim 6,

wherein the first drop-guard supporter includes

a first head having a spherical shape, and
a first coil spring for pushing the first head, and
wherein the second drop-guard supporter includes
a second head having a spherical shape, and
5 a second coil spring for pushing the second head, the
second coil spring being different from the first coil spring in at least one of
shape and material.

8. The electric dust collector of claim 6,

10 wherein the first drop-guard supporter includes
a first head having a spherical shape,
a first coil spring for pushing the first head, and
a first housing for accommodating the first coil spring,
and

15 wherein the second drop-guard supporter includes
a second head having a spherical shape,
a second coil spring for pushing the second head, and
a second housing for accommodating the second coil
spring, the second housing having an accommodating size different from an
20 accommodating size of the first housing.

9. The electric dust collector of claim 5, further comprising:

a high-voltage power supply unit having a shape mountable to the
holding unit and having both sides substantially symmetrical to each other,
25 the high-voltage power supply unit functioning as the high-voltage power
supply; and

a first high-voltage power feeding terminal and a first ground
connecting terminal mounted to one of the both sides of the high-voltage
power supply unit, the first high-voltage power feeding terminal and the first
30 ground connecting terminal being capable of each of the both sides of the
high-voltage power supply unit,

wherein the high-voltage power receiving terminal and the
ground terminal are provided at the dust-collecting unit so as to correspond

to the first high-voltage power feeding terminal and the first ground connecting terminal, respectively.

10. The electric dust collector of claim 9, further comprising:

5 a second high-voltage power feeding terminal and a second ground connecting terminal that are provided at other of the both sides of the high-voltage power supply unit;

 another holding unit provided on the other of the both sides of the high-voltage power supply unit; and

10 another dust-collecting unit attached to the another holding unit.

11. The electric dust collector of claim 5, further comprising:

 a pair of rails provided on upper sides of the dust-collecting unit, the rails being parallel with each other; and

15 a pair of eaves provided on the holding unit so as to slidably hold the rails.

12. An electric dust collector arranged to be mounted in an air channel and to be connected to a high voltage power supply, said electric dust collector comprising:

20 a limit switch having an operation lever for turning on and off the high voltage power supply;

 a holding unit mounted at the air channel and holding the limit switch;

25 a dust-collecting unit removably attached to the holding unit;

 a folded elastic member provided at the holding unit, the folded elastic member facing the operation lever of the limit switch; and

 a switch operation rib provided at the dust-collecting unit, the switch operation rib activating the folded elastic member,

30 wherein, when the dust-collecting unit is attached to the holding unit, a force is applied through the switch operation rib to the folded elastic member as to allow the folded elastic member to deform, and

 wherein the folded elastic member, upon deforming, produces a

repulsion force for moving the operation lever to activate the limit switch.

13. The electric dust collector of claim 12, wherein the folded elastic member has a U-shape or V-shape.

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14. The electric dust collector of claim 12, further comprising a support rib integrally formed with the holding unit for movably supporting the folded elastic member.

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15. The electric dust collector of claim 12,

wherein the holding unit has an opening formed therein for allowing the switch operation rib is inserted through the opening when the switch operation rib moves,

15 wherein a rib-side arm of the folded elastic member facing the switch operation rib is larger than the opening of the holding unit, and

wherein the rib-side arm of the folded elastic member almost covers the opening when the switch operation rib moves away from the opening.

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16. The electric dust collector of claim 12, wherein a lever-side arm of the folded elastic member facing the operation lever of the limit switch has a size approximately identical to a size of the limit switch.

25 17. The electric dust collector of claim 12, wherein the folded elastic member is formed integrally on an end of the operation lever.

18. The electric dust collector of claim 12, wherein the folded elastic member includes a coil spring, and an elastic force of the coil spring activates the operation lever of the limit switch.

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19. An electric dust collector comprising:

an oblong holding unit mounted in an air channel of an air conditioner;

a high-voltage applying device provided at an end of the holding unit; and

a filter unit removably provided on the holding unit,
wherein the filter unit includes

5 an air-intake grill having a shape having a center projecting to front, the air-intake grill having a first discharge needle electrically connected to the high-voltage applying device,

an air-permeable ground electrode provided on a leeward side of the first discharge needle, and

10 an air-permeable dust-collecting filter provided on a leeward side of the first discharge needle, and

wherein the air-intake grill includes

a non-conductive rib made of non-conductive resin, and

15 a conductive rib that is provided in a lattice arrangement and is electrically connected to the ground electrode.

20. The electric dust collector of claim 19, wherein the first discharge needle has a tip surrounded by the conductive rib on a projection plane.

20 21. The electric dust collector of claim 20, wherein a shortest distance between the tip of the first discharge needle and the ground electrode is substantially identical to a shortest distance between the tip of the first discharge needle and the conductive rib of the air-intake grill.

25 22. The electric dust collector of claim 19, wherein a shortest distance between the tip of the first discharge needle and the ground electrode is substantially identical to a shortest distance between the tip of the first discharge needle and the conductive rib of the air-intake grill.

30 23. The electric dust collector of claim 19, further comprising:
a pawl provided at an end of the conductive rib of the air-intake grill; and
an engaging section provided at the air-intake grill and having a

caving shape, the engaging section being engaged with the pawl to fix the conductive rib.

24. The electric dust collector of claim 19, wherein the ground electrode
5 has a frame made of metal at a perimeter thereof, said electric dust collector further comprising

a connecting unit for connecting the frame of the ground electrode with the conductive rib of the air-intake grill at a plurality of positions, and

10 wherein the connecting unit holds the non-conductive rib of the air-intake grill.

25. The electric dust collector of claim 19, further comprising a flat sub-electrode plate provided on the ground electrode at a shortest distance from the first discharge needle.

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26. The electric dust collector of claim 19, wherein the ground electrode has a frame, said electric dust collector further comprising:

a dust-collecting filter accommodated in the frame of the ground electrode;

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a burr produced on an outer side of the frame; and

a filter unit frame for surrounding the filter unit through a clearance of the frame of the ground electrode,

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wherein a frame wall-height of the filter unit frame measured from the ground electrode as a reference plane is larger than a frame-height of the ground electrode, and

wherein a thickness of the dust-collecting filter is larger than the frame-height of the ground electrode.

27. The electric dust collector of claim 19, further comprising

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an inflexible dust-collecting filter having an opening and accommodated in the ground electrode,

wherein the filter unit includes

a lattice-shaped filter frame for holding a side of the

opening of the dust-collecting filter, and

a small projection provided on the lattice of the filter frame and projecting toward the dust-collecting filter.

5 28. The electric dust collector of claim 19, further comprising:

a plurality of second discharge needles:

a needle-shaped electrode unit for connecting the second discharge needles to each other, wherein the air-intake grill has a front side having an oblong groove formed therein, and the needle-shaped electrode unit has a shape accommodated in the oblong groove:

a bend strip having an L-shape fitted in a slide projection provided on an edge of the filter unit, the bend strip serving as a high-voltage power receiving terminal of the needle-shaped electrode unit;

15 a needle-electrode cover for covering the needle-shaped electrode unit fitted in the groove; and

a pressing rib provided at the needle-electrode cover,

wherein, the needle-shaped electrode unit has a dent portion formed therein, and

20 wherein the pressing rib contacts the dent portion of the needle-shaped electrode unit as to fix the needle-electrode cover.

29. An electrical device of an electric dust collector including a filter unit and a holding unit arranged to have the filter unit attached to the holding unit, said electrical device comprising:

25 an electrical box having a chamber provided at an end of the holding unit, the electrical box having a chamber having a top opening;

a high-voltage power supply board accommodated in the electrical box;

30 an ultrasonic wave oscillator accommodated in the chamber of the electrical box; and

a lid for covering the opening top of the chamber.

30. The electrical device of claim 29, further comprising:

a bracket holder provided on a top surface of the lid; and

a high-voltage power feeding bracket having one end and other end, the one end having a high-voltage power feeding terminal held by the bracket holder, the other end having a high-voltage power connector
5 contacting the high-voltage power supply board,

wherein, the high-voltage power feeding bracket is fixed to the electrical box and contacts the lid of the chamber, and

wherein the high-voltage power connector is pressed to contact the high-voltage power supply board.

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31. The electrical device of claim 30, wherein the high-voltage power feeding bracket is made of conductive metal plate, the end and the other end of the high-voltage power feeding bracket have elasticity, and a portion of the high-voltage power feeding bracket held by the bracket holder has rigidity.

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32. The electrical device of claim 29,

wherein the chamber has an opening to supply an ultrasonic wave generated by the ultrasonic wave oscillator to the filter unit, and

wherein the chamber and the lid provides a tubular projection
20 surrounding the ultrasonic wave oscillator and projecting towards the opening.

33. The electrical device of claim 29, further comprising:

a lead wire provided from the high-voltage power supply board;
25 and

a connecting terminal provided at the electrical box and connected to the lead wire,

wherein, the electrical box has a small chamber provided in the electrical box, the small chamber surrounding the connecting terminal to
30 protect the connecting terminal from dust.

34. An electrical device of an electric dust collector including a filter unit and a holding unit to which the filter unit is mounted, said electrical

device comprising:

an electrical box provided at an end of the holding unit;

a high-voltage power supply board accommodated in the electrical box; and

5 a high-voltage power feeding bracket removably provided at the electrical box,

wherein the high-voltage power feeding bracket has a high-voltage power feeding terminal at one end thereof, and has a high-voltage power connector at other end thereof, and

10 wherein the high-voltage power connector contacts the high-voltage power supply board with a pressure as to fix the high-voltage power supply board to the electrical box.